SECTION 1: Identification

1.1. Identification

Product form : Mixture
Product name : Ferric Ammonium Citrate - Red Aqueous Solution
CAS No : 1185-57-5
Formula : C6H8O7.xFe.xNH4

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : No data available

1.3. Details of the supplier of the safety data sheet

Jost Chemical Co.
8150 Lackland Rd.
Saint Louis, Missouri 63114
T 314-428-4300 - F 314-428-4366
justin.kuehnel@jostchemical.com - www.jostchemical.com

1.4. Emergency telephone number

Emergency number : CHEMTREC 800-424-9300

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin corrosion/irritation Category 2 H315
Serious eye damage/eye irritation Category 2A H319
Specific target organ toxicity (single exposure) Category 3 H335

Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) : !

Signal word (GHS-US) : Warning

Hazard statements (GHS-US) : H315 - Causes skin irritation
                                  H319 - Causes serious eye irritation
                                  H335 - May cause respiratory irritation

Precautionary statements (GHS-US) : P261 - Avoid breathing mist, vapors
                                      P264 - Wash hands, forearms and face thoroughly after handling
                                      P271 - Use only outdoors or in a well-ventilated area
                                      P280 - Wear eye protection, face shield, protective clothing, face protection, protective gloves
                                      P302+P352 - If on skin: Wash with plenty of water
                                      P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
                                      P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
                                      P312 - Call a doctor if you feel unwell
                                      P332+P313 - If skin irritation occurs: Get medical advice/attention
                                      P337+P313 - If eye irritation persists: Get medical advice/attention
                                      P362+P364 - Take off contaminated clothing and wash it before reuse
                                      P403+P233 - Store in a well-ventilated place. Keep container tightly closed
                                      P405 - Store locked up
                                      P501 - Dispose of contents/container to an approved waste disposal plant

2.3. Other hazards

Other hazards not contributing to the classification : None under normal conditions.
Ferric Ammonium Citrate - Red Aqueous Solution
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substance
Not applicable

3.2. Mixture
This mixture does not contain any substances to be mentioned according to the criteria of section 3.2 of HazCom 2012

SECTION 4: First aid measures

4.1. Description of first aid measures
First-aid measures general:

First-aid measures after inhalation:
Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact:
Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

First-aid measures after eye contact:
Rinse with water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion:
Rinse mouth with water. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries after inhalation:
Slight irritation.

Symptoms/injuries after skin contact:
Slight irritation.

Symptoms/injuries after eye contact:
Slight irritation.

Symptoms/injuries after ingestion:

4.3. Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media:

Unsuitable extinguishing media:
No unsuitable extinguishing media known.

5.2. Special hazards arising from the substance or mixture
Fire hazard:
Combustible. High temperature.

Reactivity:
On burning: release of toxic and corrosive gases/vapours (ammonia, nitrous vapours, carbon monoxide - carbon dioxide). Decomposes on exposure to light.

5.3. Advice for firefighters
Precautionary measures fire:
Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions:
Cool tanks/drums with water spray/remove them into safety. Dilute toxic gases with water spray.

Protection during firefighting:
Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel
Protective equipment:
Gloves. Protective clothing.

Emergency procedures:
Mark the danger area. No naked flames. Wash contaminated clothes.

Measures in case of dust release:
6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: “Exposure controls/personal protection”.

Emergency procedures: Avoid contact with skin and eyes.

6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

For containment: Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. Powdered form: no compressed air for pumping over spills.

Methods for cleaning up: Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

Other information: Dispose of contaminated materials in accordance with current regulations.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Comply with the legal requirements. Clean contaminated clothing. Keep away from naked flames/heat. Observe normal hygiene standards. Keep container tightly closed. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

Hygiene measures: Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

Storage conditions: Keep container tightly closed. Keep cool. Protect from sunlight. Store in a well-ventilated place. Store in a dry place. Store locked up.

Heat-ignition: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

Prohibitions on mixed storage: oxidizing agents. water/moisture.

Storage area: Store at room temperature. Store in a dry area. Store in a dark area. Keep container in a well-ventilated place.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
</tr>
<tr>
<td>OSHA</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Ensure good ventilation of the work station. Eye fountain.


Materials for protective clothing: Wear suitable protective clothing, gloves and eye/face protection.

Hand protection: Impermeable protective gloves.

Eye protection: Chemical goggles or safety glasses.

Skin and body protection: Protective clothing.
Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended.

Environmental exposure controls: Avoid release to the environment.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Viscous. Acidic aqueous solution.</td>
</tr>
<tr>
<td>Color</td>
<td>Yellow-brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild odour Ammonia odour</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>6 - 8</td>
</tr>
<tr>
<td>pH solution</td>
<td>10 g/l (Aqueous Solution)</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water. Water: 120 g/100ml</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC content</td>
<td>0 %</td>
</tr>
<tr>
<td>Other properties</td>
<td>Translucent. Hygroscopic. Physical properties depending on the composition.</td>
</tr>
</tbody>
</table>

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

On burning: release of toxic and corrosive gases/vapours (ammonia, nitrous vapours, carbon monoxide - carbon dioxide). Decomposes on exposure to light.

#### 10.2. Chemical stability

Unstable on exposure to light. Hygroscopic.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials

No additional information available

#### 10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure: Skin and eye contact
Acute toxicity: Not classified (Lack of data)

Skin corrosion/irritation: Causes skin irritation.
Pd: 6 - 8

Serious eye damage/irritation: Causes serious eye irritation.
Pd: 6 - 8

Respiratory or skin sensitization: Not classified (Lack of data)
Germ cell mutagenicity: Not classified (Lack of data)
Carcinogenicity: Not classified (Lack of data)
Reproductive toxicity: Not classified (Lack of data)
Specific target organ toxicity (single exposure): May cause respiratory irritation.
Specific target organ toxicity (repeated exposure): Not classified (Lack of data)

Aspiration hazard: Not classified (Lack of data)

Symptoms/injuries after inhalation: Slight irritation.
Symptoms/injuries after skin contact: Slight irritation.
Symptoms/injuries after eye contact: Slight irritation.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.
Ecology - air: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
Ecology - water: Mild water pollutant (surface water). Maximum concentration in drinking water: 0.50 mg/l (ammonium) (Directive 98/83/EC); 0.200 mg/l (iron) (Directive 98/83/EC). May cause eutrophication. Harmful to aquatic organisms.

12.2. Persistence and degradability

Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Persistence and degradability: Biodegradability in water: no data available.

12.3. Bioaccumulative potential

Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Bioaccumulative potential: Not bioaccumulative.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming: No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste disposal methods

Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations.
SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Not regulated for transport

TDG
TDG Proper Shipping Name : Not regulated for transport

Transport by sea
Proper Shipping Name (IMDG) : Not regulated for transport

Air transport
Proper Shipping Name (IATA) : Not regulated for transport

SECTION 15: Regulatory information

15.1. US Federal regulations

Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
CERCLA RQ 1000 lb

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.35(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA
Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Listed on the Canadian DSL (Domestic Substances List)

EU - Regulations
Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations
Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECS (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on INSO (Mexican national Inventory of Chemical Substances)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Ferric Ammonium Citrate - Red Aqueous Solution (1185-57-5)
State or local regulations
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date : 02/10/2016

Full text of H--phrases:

<table>
<thead>
<tr>
<th>H-phrase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
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</tbody>
</table>
Ferric Ammonium Citrate - Red Aqueous Solution
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>NFPA health hazard</th>
<th>1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA fire hazard</td>
<td>0 - Materials that will not burn.</td>
</tr>
<tr>
<td>NFPA reactivity</td>
<td>0 - Normally stable, even under fire exposure conditions, and are not reactive with water.</td>
</tr>
</tbody>
</table>

HMS III Rating
Health : 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability : 0 Minimal Hazard - Materials that will not burn
Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

SDS US (GHS HazCom 2012)
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.